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U.S. Department of the Interior • U.S. Geological Survey

# MINERAL INDUSTRY SURVEYS

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## NICKEL IN AUGUST 1997

Reported domestic nickel consumption in August, on a daily average basis, was 9% less than that of July, according to the U.S. Geological Survey. Daily usage by the stainless steel industry was 18% less than the July average of 128 metric tons (t). Consumption of elemental nickel to make nickel-base corrosion resistant alloys also declined. Sales to plating companies averaged 43 t per day, 27% more than in July. Stocks of cathode and powder were at their highest level since November 1996. Percentages reported in this paragraph may not be verifiable owing to concealment of company proprietary data. Trade data for August will appear in a subsequent issue.

### Teck discovers nickel mineralization south of Voisey's Bay

In September, drilling crews employed by Teck Exploration Limited began intersecting significant nickel-copper-cobalt mineralization on claims shared equally by Donner Resources Limited and Northern Abitibi Mining Corp. in northeastern Labrador. The claims are about 90 kilometers south of the immense Voisey's Bay nickel deposit. The diamond drilling project is part of a much larger regional exploration program put together by a consortium of relatively small Canadian exploration companies and supported by Teck (Brockelbank, 1997).

Donner acquired extensive claims in the area in early 1995. Since then, Donner has obtained additional holdings by forming joint ventures with thirteen other exploration companies. These holdings form the South Voisey's Bay (SVB) Project and now total about 1,500 square kilometers (Donner Resources Limited, 1997a).

During the 1995 and 1996 field seasons, Donner focused its exploration efforts on several large gabbroic intrusions that contained low but significant copper, nickel, and cobalt values. These layered intrusions are geologically similar to the host rocks associated with sulfide mineralization at Voisey's Bay.

Each of the SVB intrusions has a thick upper layer of coarse-grained gabbro. The thinner, lower layer of each intrusion is composed of a fine-grained olivine gabbro called troctolite. Preliminary drilling indicates that pentlandite, chalcopyrite, and other sulfides were deposited in a zone along the contact between the intruding troctolite and the underlying country rock—a sulfide-rich, graphitic gneiss.

Thirty-two holes have been drilled to date in the project area. Drill hole 97-67 intersected three separate, but thin, zones of massive sulfides between 176 and 180 meters downhole near the contact with the gneiss. The first zone averaged 1.73% nickel and 1.64% copper over 0.3 meters; the second, 1.93% nickel and 1.07% copper over 0.6 meters; and the third, 1.35% nickel and 0.84% copper over 0.1 meters. A second drill hole—No. 97-75—subsequently intersected a 1.1 meter-thick section of massive sulfides that assayed 11.75% nickel, 9.70% copper, and 0.43% cobalt. The mineralization occurred at a depth of 177 meters—13 meters below the base of the intrusion—and contained visible pentlandite (Donner Resources Limited, 1997a).

In early 1997, Donner retained Teck Exploration Limited as its general contractor for the upcoming field season, budgeting more than \$5 million for a diamond drilling program and follow-up geological and geophysical work. As part of the contracting agreement, Teck Corporation—the exploration company's parent—was given warrants for 1.4 million shares of Donner stock. On October 20, Teck exercised these warrants, acquiring the 1.4 million shares for C\$2.8 million, or C\$2.00 per share (Donner Resources Limited, 1997b). As a result of the exercise, Teck now holds 2.8 million shares of Donner stock, giving Teck a 12.2% interest in the company. Teck also has warrants to purchase an additional 1.4 million shares on or before October 18, 1998. Under the terms of the agreement, Teck can earn a 50% interest in any of Donner's interests in the South Voisey's Bay Project.

## References Cited

- Brockelbank, Thomas, 1997, Teck hits nickel in Labrador: Northern Miner, v. 83, no. 35, October 27, p. 1 and 11.
- Donner Resources Limited, 1997a, South Voisey's Bay project update: Donner Resources Limited press release, October 29, 7 p. (Accessed November 7, 1997, on the World Wide Web at URL <http://www.donner-resources.com/pr102997.htm>)
- Donner Resources Limited, 1997b, Teck Corporation exercises warrants: Donner Resources Limited press release, October 20, 1 p. (Accessed November 7, 1997, on the World Wide Web at URL <http://www.donner-resources.com/pr102097.htm>)

TABLE 1  
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE 1/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
1996:					
August	6,340	1,450	140	7,930	67,200
September	6,050	1,540	178	7,770	75,000
October	6,740	1,750	320	8,810	83,800
November	5,700	1,340	365	7,400	91,200
December	5,690	1,650	181	7,520	98,700
January-December	78,100	17,600	2,980	98,700	XX
1997:					
January	6,900	2,000	101	9,000	9,000
February	5,950	1,510	129	7,590	16,600
March	5,730	1,580	253	7,570	24,200
April	6,480	1,490	570	8,540	32,700
May	6,600	1,300	410	8,300	41,000
June	6,630	1,280	434	8,350	49,300
July	6,600	1,640	299	8,540	57,900
August:					
Steel:					
Stainless and heat resisting	1,860	1,330	W	3,200	29,300
Alloy (excludes stainless)	611	W	W	611	5,130
Superalloys	873	--	--	873	6,340
Copper-nickel alloys	W	W	--	W	W
Electrical, magnetic, and expansion alloys	W	--	--	W	W
Other nickel & nickel alloys	W	W	W	W	W
Cast iron	W	--	W	W	W
Electroplating (sales to platers)	1,320	--	W	1,320	10,200
Chemical and chemical uses	W	--	W	W	W
Other uses	1,510	122	164	1,800	14,700
Total reported	6,180	2/ 1,460	164	7,790	65,700
Total all companies (calc) 3/	XX	XX	XX	11,300	95,600
1997: January-August	51,100	12,300	2,360	65,700	XX
1996: January-August	53,900	11,300	1,930	67,200	XX

W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Of consumption, 5,060 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.

3/ Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (68.69%) to apparent primary consumption for 1994.

TABLE 2  
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS,  
BY FORM AND USE 1/ 2/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total
1996:				
August	3,340	429	77	3,850
September	2,910	277	82	3,270
October	2,770	472	82	3,320
November	6,170	625	64	6,860
December	4,990	1,540	78	6,610
1997:				
January	4,370	659	55	5,080
February	3,970	231	180	4,390
March	4,090	240	603	4,940
April	3,780	366	633	4,770
May	3,240	344	581	4,170
June	3,880	389	302	4,570
July r/	4,640	383	136	5,160
August:				
Steel (stainless, heat resisting and alloy)	3,150	266	109	3,520
Nonferrous alloys 3/	1,810	(4/)	(5/)	1,810
Foundry (cast irons)	(6/)	--	--	(5/)
Chemical (catalysts, ceramics, plating salts, etc.) and unspecified uses	179	--	78	257
Total	5,130	266	187	5,580

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Stocks held by companies that consume nickel in more than one end use category are credited to the major category. Stocks are subject to revisions owing to inventory adjustment.

3/ Includes superalloys, nickel-copper and copper-nickel alloys, permanent magnet alloys, and other nickel alloys.

4/ Included in "Chemicals and unspecified uses" category of "Oxide-sinter, salts, and other forms."

5/ Included in "Chemicals and unspecified uses" category.

6/ Included in "Chemicals and unspecified uses" category of "Cathodes, pellets, briquets, and powder."

TABLE 3  
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE 1/

(Metric tons, nickel content)

Period	Consumption			Stocks		
	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap
1996:						
August	2,860	1,080	3,940	3,360	98	3,460
September	3,490	871	4,370	3,100	110	3,210
October	3,600	773	4,370	3,340	107	3,450
November	3,250	785	4,030	3,630	89	3,720
December	3,320	656	3,970	3,510	88	3,600
January-December	43,400	9,980	53,400	XX	XX	XX
1997:						
January	4,800	844	5,650	3,160	116	3,280
February	3,880	805	4,690	3,290	114	3,400
March	4,250	1,010	5,260	4,090	104	4,190
April	5,260	789	6,050	3,820	113	3,940
May	4,750	840	5,590	3,790	114	3,900
June	4,770	755	5,520	3,900	112	4,020
July	5,200 r/	844	6,040 r/	3,380	115	3,490
August	3,780	760	4,540	3,930	114	4,040
1997: January-August	36,700	6,650	43,300	XX	XX	XX
1996: January-August	29,700	6,890	36,600	XX	XX	XX

r/ Revised. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

3/ Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

Period and country of origin	Cathodes, pellets, and briquets	Powder and flakes	Ferro- nickel	Metal- lurgical- grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
1996:										
July	7,230	684	1,470	18	238	274	216	10,100	90,500	42
August	9,250	835	1,120	14	235	319	265	12,000	103,000	44
September	9,390	629	884	33	416	322	234	11,900	114,000	52
October	7,850	779	1,050	60	581	373	311	11,000	125,000	67
November	9,820	670	1,520	99	328	308	290	13,000	138,000	38
December	9,180	815	969	21	351	275	251	11,900	150,000	61
January-December	113,000	9,690	16,000	463	4,270	3,790	3,270	150,000	XX	636
1997:										
January	7,640	954	1,180	111	364	263	265	10,800	10,800	57
February	9,310	945	1,180	395	696	392	242	13,200	23,900	53
March	14,500	1,130	1,070	277	544	342	198	18,100	42,000	73
April	7,920	948	1,050	347	572	433	294	11,600	53,600	78
May	13,900	838	1,420	217	370	469	297	17,500	71,100	99
June	5,240	625	1,240	49	482	511	256	8,400	79,500	40
July:										
Australia	896	--	--	--	10	--	11	917	6,680	--
Canada	945	348	--	10	86	235	4	1,630	33,800	1
Colombia	--	--	315	--	--	--	--	315	1,030	--
Dominican Republic	--	--	708	--	--	(5/)	--	708	4,900	--
Finland	540	59	--	--	--	--	45	644	3,330	--
France	61	--	201	--	65	--	16	343	1,680	(5/)
Germany	--	6	--	--	22	--	21	49	484	69
Japan	--	34	--	--	4	9	51	98	578	8
New Caledonia	--	--	--	--	--	--	--	--	2,040	--
Norway	2,770	--	--	--	10	--	--	2,780	14,700	--
Russia	1,770	44	--	--	--	--	--	1,820	14,900	--
South Africa	--	--	--	--	--	--	--	--	201	--
United Kingdom	745	5	--	--	114	--	1	865	1,960	1
Zimbabwe	298	--	--	--	--	--	--	298	892	--
Other	160	24	55	--	332	285	121	977	3,670	3
Total	8,190	520	1,280	10	643	529	271	11,400	90,900	82
1997: January-July	66,700	5,960	8,410	1,410	3,670	2,940	1,820	90,900	XX	483
1996: January-July	67,400	5,970	10,400	237	2,360	2,190	1,910	90,500	XX	374

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5  
U.S. EXPORTS OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

Period and country of destination	Cathodes, pellets, and briquets	Powder and flakes	Ferro- nickel	Metal- lurgical- grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
1996:										
July	7	50	650	480	778	2,650	364	4,980	25,700	30
August	44	97	299	348	703	2,200	424	4,120	29,800	64
September	6	80	179	359	1,210	2,230	292	4,360	34,200	27
October	20	79	359	420	1,280	2,270	185	4,620	38,800	63
November	19	88	324	517	918	1,610	197	3,670	42,500	59
December	21	75	433	393	960	1,850	551	4,280	46,800	21
January-December	586	1,060	3,330	4,210	10,900	22,800	3,940	46,800	XX	439
1997:										
January	20	72	442	513	862	1,740	455	4,100	4,100	56
February	39	114	416	134	1,000	1,690	515	3,920	8,020	89
March	26	93	616	172	1,210	1,280	488	3,880	11,900	61
April	33	84	725	148	1,480	2,740	684	5,890	17,800	158
May	28	102	913	124	1,290	1,610	439	4,510	22,300	58
June	52	97	900	172	963	3,540	258	5,990	28,300	56
July:										
Australia	--	--	--	--	--	--	12	12	79	2
Belgium	--	18	--	1	10	37	4	70	276	1
Canada	--	4	--	55	455	229	117	860	7,600	1
Germany	1	8	--	--	44	--	1	54	473	--
India	(5/)	--	249	--	7	4	--	261	1,430	--
Italy	--	1	--	--	--	--	--	1	95	--
Japan	--	2	51	1	38	56	37	186	2,820	3
Korea, Republic of	--	4	--	--	--	1,050	2	1,060	5,170	12
Mexico	12	9	10	--	--	900	77	1,010	2,770	23
Netherlands	--	--	--	--	(5/)	6	87	93	333	--
Spain	--	--	--	--	--	333	--	333	2,740	--
Sweden	--	--	--	--	104	19	--	123	1,550	--
Taiwan	--	1	350	--	3	246	14	614	4,260	1
United Kingdom	5	(5/)	--	--	--	--	3	8	351	3
Other	1	8	--	108	15	90	74	297	3,320	63
Total	19	55	661	165	676	2,970	428	4,980	33,300	109
1997: January-July	218	617	4,670	1,430	7,490	15,600	3,270	33,300	XX	588
1996: January-July	476	641	1,730	2,170	5,800	12,600	2,290	25,700	XX	205

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight )

Period and country of origin	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date 2/
1996:									
July	188	117	195	90	(3/)	44	107	743	5,960
August	91	219	97	187	(3/)	49	615	1,260	7,220
September	117	70	144	133	(3/)	50	59	573	7,800
October	249	151	120	90	(3/)	72	60	741	8,540
November	349	161	168	81	(3/)	66	29	854	9,390
December	151	178	256	145	(3/)	48	64	843	10,200
January-December	2,780	2,110	1,810	1,520	2	832	1,190	10,200	XX
1997:									
January	208	132	196	98	--	100	108	841	841
February	181	202	190	149	--	96	107	926	1,770
March	265	184	266	90	(3/)	117	52	974	2,740
April	234	186	283	139	--	298	61	1,200	3,940
May	457	148	290	190	--	104	56	1,250	5,190
June	431	190	346	150	3	134	68	1,320	6,510
July:									
Australia	384	--	--	--	--	--	--	384	1,300
Belgium	16	--	--	--	--	--	--	16	112
Canada	(3/)	--	12	(3/)	--	4	1	17	204
France	--	(3/)	50	34	--	3	(3/)	88	660
Germany	3	98	69	203	(3/)	7	2	382	1,900
Italy	--	110	3	--	--	24	(3/)	136	541
Japan	--	--	4	(3/)	--	103	3	111	541
Mexico	--	--	--	--	--	--	--	--	4
Netherlands	--	--	--	--	--	--	3	3	64
South Africa	19	--	--	--	--	--	20	39	239
Sweden	--	(3/)	141	6	--	31	(3/)	177	1,090
United Kingdom	41	16	(3/)	1	--	10	2	70	725
Other	--	--	4	3	--	4	35	46	600
Total	463	224	283	247	(3/)	186	66	1,470	7,980
1997: January-July	2,240	1,270	1,860	1,060	4	1,030	518	7,980	XX
1996: January-July	1,820	1,330	1,020	881	1	547	360	5,960	XX

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 7  
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight )

Period and country of destination	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total 2/	Total year to date 2/
1996:									
July	335	349	148	628	8	84	451	2,000	14,100
August	540	184	176	619	5	96	183	1,800	15,900
September	274	177	166	622	9	78	176	1,500	17,400
October	602	240	147	600	12	49	394	2,040	19,400
November	485	340	113	725	5	74	276	2,020	21,400
December	478	191	119	971	9	146	129	2,050	23,500
January-December	5,710	3,210	1,560	8,000	200	1,270	3,520	23,500	XX
1997:									
January	541	320	115	838	10	91	120	2,030	2,030
February	641	222	137	554	20	136	180	1,890	3,930
March	425	334	152	845	23	99	597	2,480	6,400
April	344	225	224	649	14	90	374	1,920	8,320
May	262	290	212	810	15	81	146	1,820	10,100
June	357	319 r/	195	781	11	131	686 r/	2,480 r/	12,600 r/
July:									
Australia	--	2	42	101	--	21	--	166	554
Belgium	--	1	--	8	--	18	--	27	128
Canada	49	26	36	62	6	27	45	251	2,120
France	116	23	1	5	8	(3/)	18	171	1,410
Germany	39	10	(3/)	10	(3/)	1	1	61	501
India	1	--	1	1	--	(3/)	--	2	11
Ireland	--	(3/)	37	--	--	--	1	38	257
Italy	9	--	(3/)	63	--	2	(3/)	74	773
Japan	4	2	5	102	--	2	38	153	1,440
Korea, Republic of	--	(3/)	(3/)	29	--	--	12	41	676
Mexico	1	3	48	1	1	8	9	69	430
Netherlands	--	15	1	4	--	(3/)	(3/)	20	311
Singapore	1	5	19	1	--	--	1	27	135
Spain	--	--	1	--	--	(3/)	(3/)	2	69
Sweden	--	--	--	3	3	--	--	6	124
Switzerland	7	--	--	7	--	(3/)	(3/)	14	106
Taiwan	9	(3/)	1	(3/)	--	4	20	34	294
United Kingdom	39	85	34	115	(3/)	2	3	278	2,820
Other	18	21	3	13	1	29	291	379	2,280
Total	293	193	229	525	19	114	439	1,810	14,400
1997: January-July	2,860	1,910	1,270	5,000	112	742	2,540	14,400	XX
1996: January-July	3,330	2,080	841	4,470	160	826	2,360	14,100	XX

r/ Revised. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.



TABLE 8  
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

	Percent	
	Wrought	Cast
August 1997:		
Stainless and heat resisting steels	98	2
Alloy steels	77	23
Superalloys	75	25
Copper-nickel alloys	98	2
Other nickel-base alloys	100	(1/)

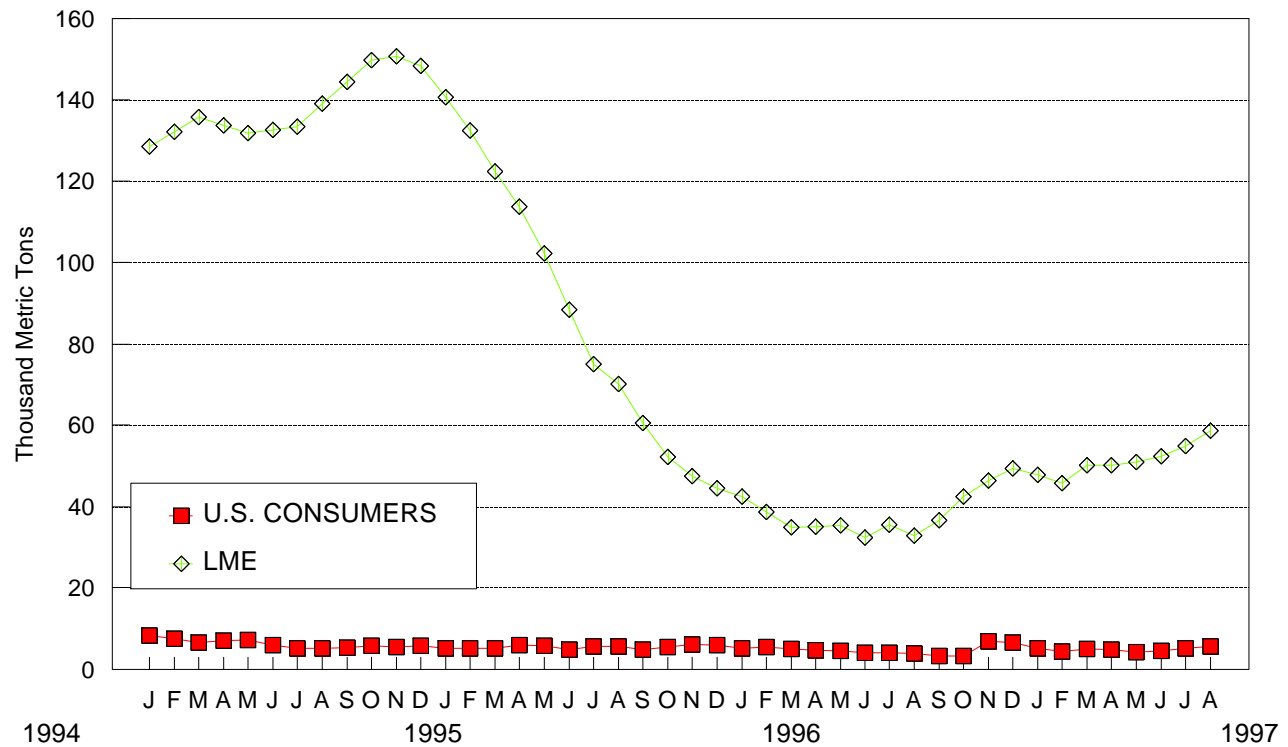
1/ Less than 1/2 unit.

TABLE 9  
NICKEL PRICES

Date	Cathode NY Dealer \$/lb.	LME Cash \$/t	LME Cash \$/lb.	18/8 Stainless steel scrap Pittsburgh \$/long ton(gw)
1997:				
Average for the month of:				
July	3.175	6,835.500	3.101	809
August	3.144	6,761.300	3.067	795
September	3.042	6,503.841	2.950	790
For week ending:				
July 4	3.22-3.29	6,808.700	3.088	800-810
July 11	3.19-3.23	6,760.800	3.067	800-820
July 18	3.15-3.22	6,716.500	3.047	800-820
July 25	3.16-3.18	6,698.000	3.038	800-820
August 1	3.17-3.49	7,285.800	3.305	800-820
August 8	3.31-3.43	7,115.500	3.228	790-800
August 15	3.11-3.32	6,654.900	3.019	790-800
August 22	3.09-3.13	6,591.300	2.990	790-800
August 29	3.06-3.10	6,518.125	2.957	790-800
September 5	3.10-3.12	6,563.300	2.977	785-795
September 12	3.12-3.14	6,527.000	2.961	785-795
September 19	2.99-3.04	6,376.600	2.892	785-795
September 26	2.99-3.03	6,406.500	2.906	785-795

Sources: Platt's Metals Week and American Metal Market.

## 1994-97 STOCKS



## 1994-97 AVERAGE MONTHLY PRICES

(Derived from Metals Week and American Metal Market quotations)

